FULL DRAINAGE REPORT

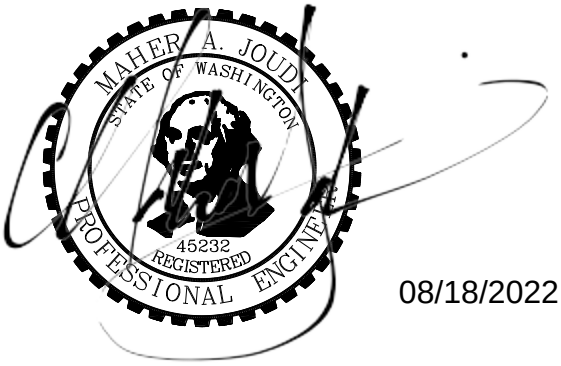
(FDR)

for

755 5TH AVE NW DUPLEX

NW Juniper St & 5th Ave NW, Issaquah, Washington

NE ¼, Section 28, Township 24 North, Range 6 East, W.M.



08/18/2022

DRS Project No. 20010
City of Issaquah File No.

Owner/Applicant

Hultquist Homes
PO Box 1987
Issaquah, WA 98027

Report Prepared by

D. R. STRONG Consulting Engineers, Inc.
620 7th Avenue
Kirkland WA 98033
(425) 827-3063

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DRAINAGE INFORMATION SUMMARY FORM

PROJECT NAME: **755 5TH AVE NW DUPLEX**

PROJECT ENGINEER: **D. R. STRONG CONSULTING ENGINEERS INC.**

PROJECT APPLICANT: **HULTQUIST HOMES**

PROJECT SITE AREA: **0.11 ACRES**

PROJECT DEVELOPMENT AREA: **0.11 ACRES**

NUMBER OF LOTS (IF APPLIES): **1**

Summary Table

Drainage Basin Information		
	TDA 1	
On-Site Sub-Basin Area (acres)	0.11	
Type of Storage Proposed	None	
Approx. Live Storage Volume (cu. ft.)	N/A	
Approx. Dead Storage Volume (cu. ft.)	N/A	
Soil Type(s) (Natural Resource Conservation Service)	Br – Briscot Silt Loam	
Pre-developed Runoff Rates	N/A	
Q (cfs.) 2 yr.		
10 yr.		
50 yr.		
Post-development Runoff Rates (without quantity controls)	N/A	
Q (cfs.) 2 yr.		
10 yr.		
50 yr.		
Post-development Runoff Rates (with quantity controls)	N/A	
Q (cfs.) 2 yr.		
10 yr.		
50 yr.		
Bypass Area (bypass)		
Number of acres (subtracted from runoff analysis)	N/A	
.		
Offsite Upstream Area		
Number of acres (Upstream of Site)	0.0 acres	
Number of acres (Upstream of Road)	0.0 acres	
Offsite Downstream Flow	N/A	
Q (cfs) 50 yr.		

Project Overview and Executive Summary

Drainage Plan Description

This Full Drainage Report was prepared in accordance with the 2014 Amended Washington State Department of Ecology Stormwater Management Manual for Western Washington and the City of Issaquah 2017 Stormwater Design Manual Addendum (Manual), Chapter 2.4, Minimum Requirements. The Project is located near 755 5th Ave NW, Issaquah, Washington (Site) also known as Tax Parcel Numbers 884390-0500. This proposed site development involves the creation of one duplex and associated utilities and improvements.

See Figures 1 through 7 for maps of the Study Area.

Drainage Basins

Pre-Developed Basin

The total existing Site area is approximately 4,807 s.f. (0.11 acres). The Site is currently developed with a sidewalk and basketball court.

The Site is generally flat with sections particularly on the northwest corner that slope to the west. The Site contains one Natural Discharge Point (NDP) and one Natural Discharge Area (NDA) enclosed within one Threshold Discharge Area (TDA). Runoff sheet flows northwesterly over the Site and landscaping off-site before being collected by an existing conveyance system in NW Juniper St. The runoff continues the west in a pipe and CB network before flowing northerly once it reaches 7th Ave NW.

Figure 3 is a map of existing Site conditions. Figure 4 shows the USDA Soils Map. The downstream path of TDA 1 is described in detail in downstream analysis.

Post-Developed Basin

The applicant is seeking approval to construct a single duplex unit.

Total project new plus replaced impervious will total approximately 2,350 sf, therefore Minimum Requirements 1 – 5 will be applied to all new and replaced impervious surface.

Project runoff will discharge into the conveyance system in Juniper which is the natural discharge location.

Adjacent Frontage Improvements

NW Juniper is currently developed; no additional frontage improvements are anticipated.

755 5TH AVE NW DUPLEX

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Minimum Requirement 1:

Full Stormwater Site Plan Narrative

Upstream Analysis

In evaluating the upstream area, we reviewed the USGS topographic survey mapping of the area, and field topographic survey, performed by D.R. STRONG Consulting Engineers, Inc.

In evaluating the upstream area, we reviewed the King County topographic map as well as performed a field reconnaissance. The upstream tributary area for the Site appears to be negligible as the area is relatively flat and vegetated. Runoff from NW Juniper St to the north is conveyed west, away from the project Site. Runoff from the south, west and east is collected by an existing stream flowing west of the Site and will not impact the project area.

Downstream Analysis

The Site is generally flat with sections particularly on the northwest corner that slope to the west. The Site contains one Natural Discharge Point (NDP) and one Natural Discharge Area (NDA) enclosed within one Threshold Discharge Area (TDA). Runoff sheet flows northwesterly over the Site and landscaping off-site before being collected by an existing conveyance system in NW Juniper St. The runoff continues the west in a pipe and CB network before flowing northerly once it reaches 7th Ave NW.

The downstream path is described in detail below. The downstream area was evaluated by reviewing available resources, and by conducting a field reconnaissance on February 4, 2020 with a weather condition of partly cloudy. See downstream map and photos in Appendix E for more detail.

During the field investigation, there were no problems observed at the time of the field reconnaissance.

NDA 1 Downstream Path:

Point “A1” is the Natural Discharge Location (NDL1) located along the northern portion of the western property line. Runoff flows west as sheet flow across the parcel to the west and through landscaping into NW Juniper St. Runoff continues west before reaching a type 1 catch basin at the intersection on NW Juniper St and 6th Ave NW. The downstream path continues westerly through a series of conveyance pipes and catch basins in NW Juniper St. Runoff is then conveyed north at 7th Ave NW.

FIGURE 1
VICINITY MAP

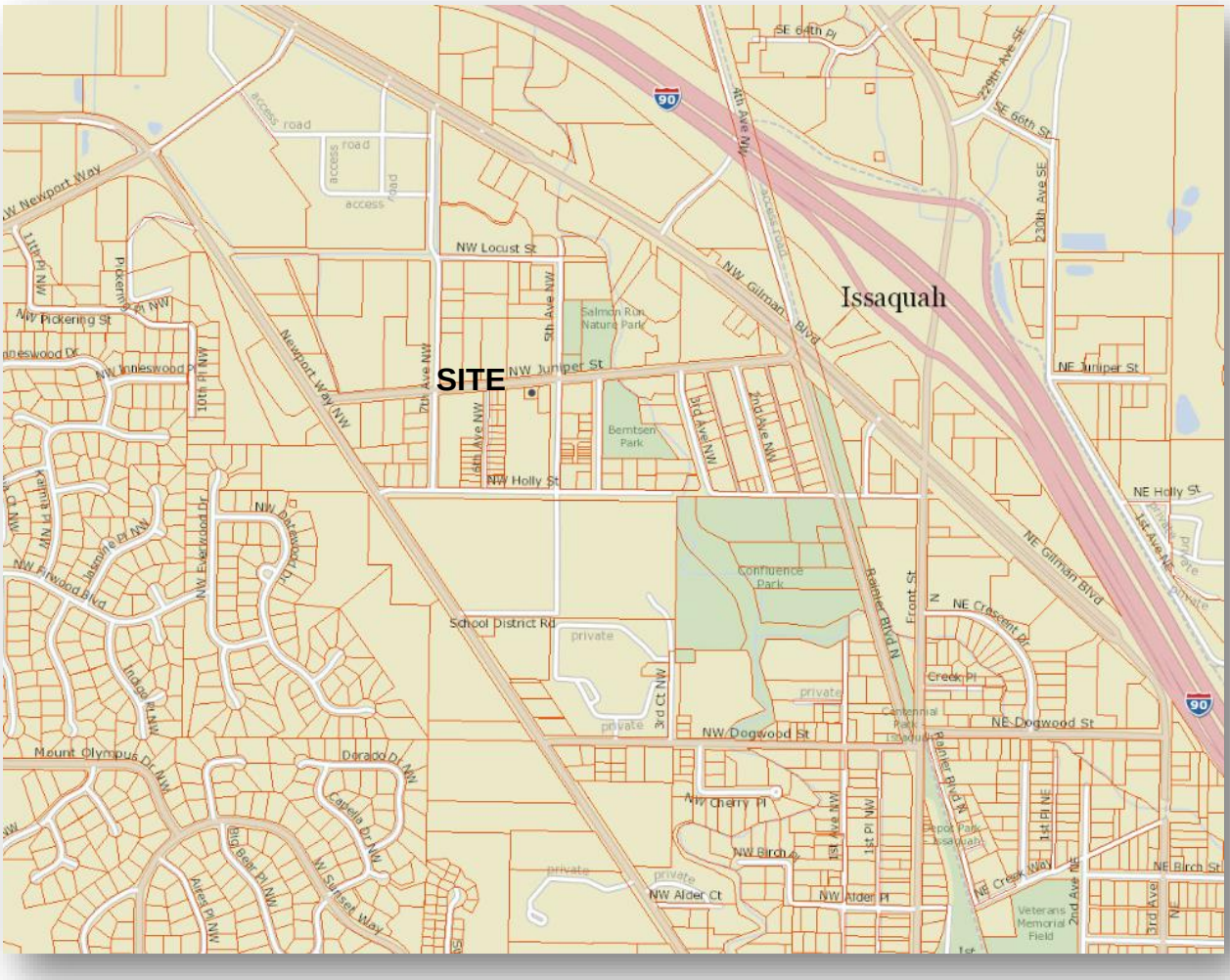

FIGURE 2
AERIAL MAP

FIGURE 3
EXISTING SITE MAP

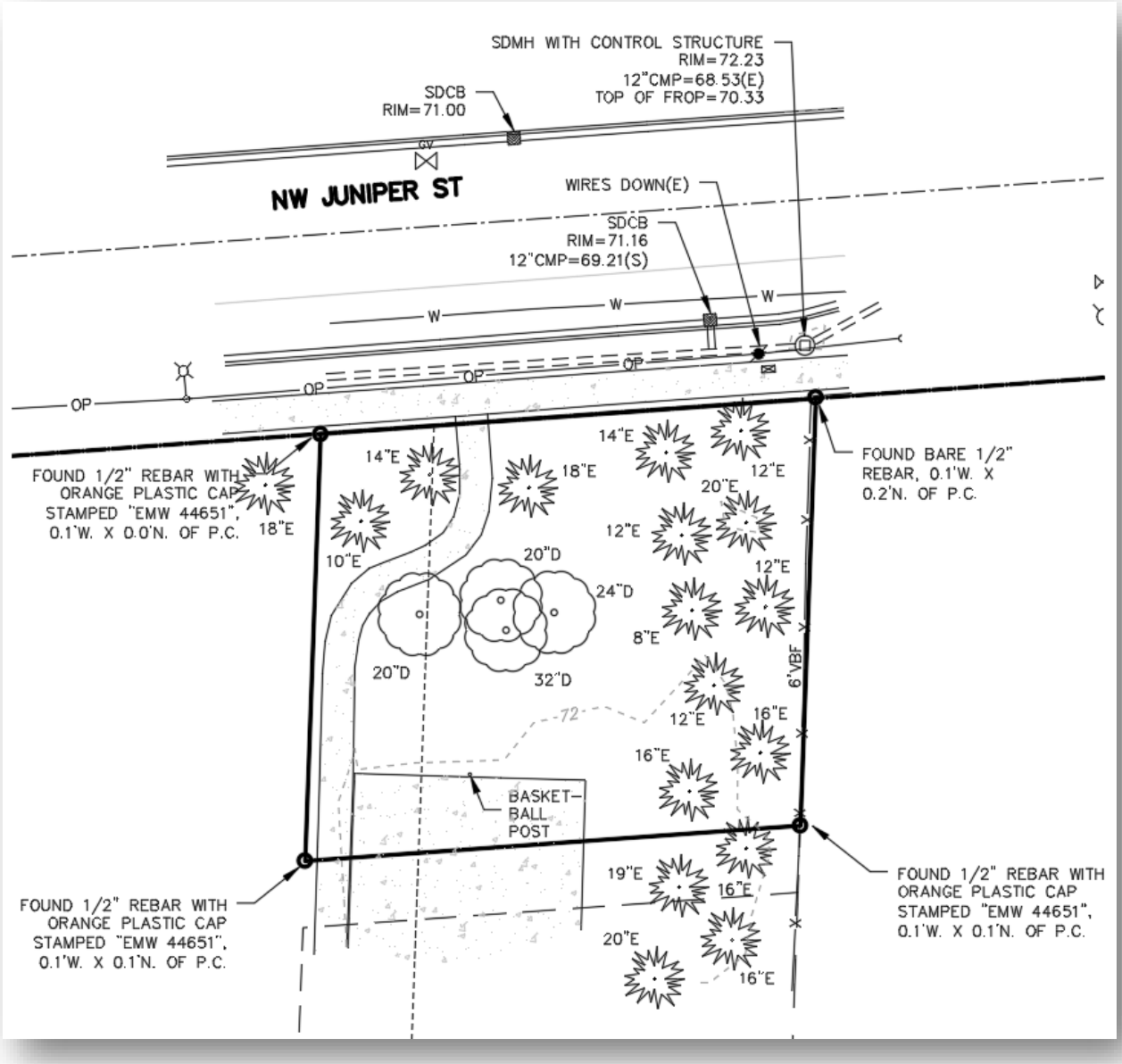

FIGURE 4
DOWNSTREAM MAP

FIGURE 5
USDA SOILS MAP

King County Area, Washington

Br—Briscot silt loam

- **Map Unit Setting**

- *National map unit symbol:* 1hmsx
- *Elevation:* 20 to 250 feet
- *Mean annual precipitation:* 30 to 55 inches
- *Mean annual air temperature:* 48 to 50 degrees F
- *Frost-free period:* 160 to 210 days
- *Farmland classification:* Prime farmland if drained

- **Map Unit Composition**

- *Briscot and similar soils:* 88 percent
- *Minor components:* 12 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*
- **Description of Briscot**
- **Setting**

- *Landform:* Flood plains
- *Parent material:* Alluvium

- **Typical profile**

- *H1 - 0 to 9 inches:* silt loam
- *H2 - 9 to 60 inches:* stratified fine sand to silt loam

- **Properties and qualities**

- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Somewhat poorly drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* About 12 to 24 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water storage in profile:* High (about 11.1 inches)

- **Interpretive groups**

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 4w
- *Hydrologic Soil Group:* B/D
- *Forage suitability group:* Seasonally Wet Soils (G002XN202WA)
- *Hydric soil rating:* Yes

- **Minor Components**
- **Puyallup**

- *Percent of map unit:* 5 percent
- *Hydric soil rating:* No

- **Oridia**

- *Percent of map unit:* 3 percent
- *Landform:* Depressions
- *Hydric soil rating:* Yes

- **Renton**

- *Percent of map unit:* 2 percent
- *Landform:* Depressions
- *Hydric soil rating:* Yes

- **Puget**

- *Percent of map unit:* 1 percent
- *Landform:* Depressions
- *Hydric soil rating:* Yes

- **Woodinville**

- *Percent of map unit:* 1 percent
- *Landform:* Depressions
- *Hydric soil rating:* Yes

Minimum Requirement 2:
Construction Stormwater Pollution Prevention Plan (SWPPP)

A complete Construction Stormwater Pollution Prevention Plan will be submitted at the time of final engineering. Each of the 13 construction SWPP elements will be considered and discussed below.

Element 1: Preserve Vegetation/ Mark clearing limits: Vegetation shall be preserved (BMP C101) by restricting construction activities outside of the clearing limits shown. Clearing limits shall be marked with a high visibility plastic fence (BMP C103).

Element 2: Establish construction access: A stabilized construction entrance (BMP C120) will be provided at the location of proposed access road to the Site.

Element 3: Control flow rates: Flow rates shall be controlled by a silt fence (BMP C223) at the downslope edge of the clearing limits and a vegetated strip (BMP C234) between the filter fence and the west property line.

Element 4: Install sediment controls: Sediment shall be controlled by a silt fence (BMP C223) at the downslope edge of the clearing limits and a vegetated strip (BMP C234) between the filter fence and the west property line.

Element 5: Stabilize soils: Unworked soils shall be stabilized with mulching (BMP C121) and/ or dust control (BMP C140) measures. Excavated material will be loaded directly into a dump truck staged on site and therefore, no soil stockpiles are proposed on this site. Final site stabilization will be achieved through compost-amending (BMP T5.13).

Element 6: Protect slopes: Slopes will be protected with compost-amended soils (BMP T5.13) and permanent seeding and planting (BMP C120).

Element 7: Protect drain inlets: Drain inlets will be protected with a catch basin filter insert (BMP C220)

Element 8: Stabilize channels and outlets: No channels or outfalls affected by this project. The flow to the existing man-made culvert will not increase as a result of this project.

Element 9: Control pollutants: Contractor shall implement concrete handling (BMP C151) and material storage, delivery, and containment (BMP C153) measures as well as other appropriate pollution source control measures in areas of: construction equipment maintenance or fueling; handling or storage of waste materials, construction debris, fertilizers, and chemicals; and other activities that may contribute pollutants to stormwater. The following specific requirements apply:

A) Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and

other materials that have potential to pose a threat to human health or the environment.

B) On-site fueling tanks shall include secondary containment.

C) Maintenance, fueling and repair of heavy equipment and vehicles shall be conducted using spill prevention and control measures consistent with Volume IV, Chapters 2 and 3.

D) Contaminated surfaces shall be cleaned immediately following any spill incident.

E) Application of fertilizers and pesticides shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' label requirements for application rates and procedures shall be followed.

F) BMP's shall be used to prevent contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to, bulk cement, cement kiln dust, fly ash, new concrete washing approved treatment, curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout/ water.

G) Concrete truck chutes, pumps, and internals shall be washed out only into formed areas awaiting installation of concrete. Unused concrete remaining in the truck and pump shall be returned to the originating batch plant for recycling. Washdown from concrete hand tools and work areas shall not drain directly to natural or constructed stormwater conveyances. When no formed areas are available, washwater and leftover product shall be contained in a lined container and disposed of in a manner that does not violate groundwater or surface water quality standards.

H) Where feasible, and not in conflict with International Fire Code, store potential stormwater pollutant materials inside a building or under a cover and/or containment. Liquid and applicable solid materials must be stored in containers suitable for the contents and inspected for corrosion, structural failure, tight fitting lids, leaks and overfills. Store materials in areas sloping away from storm drainage systems or surface waters. Sweep and clean the job site regularly to prevent buildup of contaminating materials. Promptly clean up solid and liquid pollutant leaks and spills and dispose of in a manner consistent with and all other federal, state, and local regulations in order to prevent stormwater pollution.

Element 10: Control de-watering: a dewatering plan will be provided as required at the time of construction engineering.

Element 11: Maintain BMPs: BMP's shall be inspected and maintained by the contractor during construction and removed within 30 days after the

City determines that the site is stabilized, provided that temporary BMP's may be removed when they are no longer needed.

Element 12: Manage the project: This plan shall be fully implemented at all times and modified whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to waters of the State.

Element 13: Protect Low Impact Development (LID) BMPs: Permittees must protect all bioretention and rain garden facilities from sedimentation through installation and maintenance of erosion and sediment control BMPS on portions of the site that drain into the bioretention and/or rain garden facilities. Restore the facilities to their fully functioning condition if they accumulate sediment during construction. Restoring the facility must include removal of sediment and any sediment-laden bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.

Permittees must maintain the infiltration capabilities of bioretention and rain garden facilities by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.

Permittees must control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements.

Permittees must clean permeable pavements fouled with sediments or no longer passing an initial infiltration test using local stormwater manual methodology or the manufacturer's procedures.

Permittees must keep all heavy equipment off existing soils under lid facilities that have been excavated to final grade to retain the infiltration rate of the soils.

Minimum Requirement 3:
Source Control of Pollution

Mobile fueling of vehicles and heavy equipment will occur on the Site during construction activities. The following BMP's must be implemented:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Minimum Requirement 4:
Preservation of Natural Drainage Systems or Outfalls and Provision of Off-Site Mitigation

The Project consists of one Threshold Discharge Area (TDA1). The TDA1 contains one Natural Discharge Area (NDA 1) and Natural Discharge Location (NDL 1). Existing runoff from (TDA 1, NDA 1) flows westerly and leaves the Site as sheet flow across the western property line near the northwest property corner. Based on an inspection of the USGS topographic survey of the area, runoff naturally drains west for TDA1.

Project runoff will continue to discharge to NW Juniper Street. Flows released from the Site will be conveyed through a series of pipes and catch basins to the existing public storm drainage.

Minimum Requirement 5:
On-site Stormwater Management

The Project triggers MR's 1 – 5 and is therefore required to evaluate the List #1 BMP's in accordance with the Manual.

Lawn and Landscaped Areas:

1. The Project will implement BMP T5.13 Post-Construction Soil Quality and Depth in accordance with the Manual. Within the limits of Site disturbance, duff and topsoil (where available) will be retained in an undisturbed state and stockpiled for later use to stabilize and amend soils throughout the Site. Soil amendment will be accomplished by tilling three inches of compost eight inches into disturbed soil in the areas of planting beds or by tilling two inches of compost eight inches into disturbed soil in the areas of lawn turf. Two to four inches of arborist wood chip, coarse bark mulch, or compost mulch shall be added to planting beds after final planting.

Roofs:

1. Full dispersion is not feasible because the minimum 100' vegetated flowpath cannot be provided due to lot sizes.
2. Rain Gardens for roof drains are not feasible due to lot size constraints.
3. Downspout dispersion systems are not feasible because the minimum 25' vegetated flowpath cannot be provided.
4. Perforated stub-out connections will be used for roof downspout collection systems.

Other Hard Surfaces:

1. Full dispersion is not feasible because the minimum 100' vegetated flowpath cannot be provided due to lot sizes.
2. Permeable pavement is not feasible due to till soil that is unsuitable for infiltration.
3. Bioretention planters will be utilized for driveway runoff to the maximum extent feasible.
4. Sheet flow dispersion with minimum 10' flowpath will be used for driveways that cannot be served by bioretention planters.

APPENDIX A
DOWNSTREAM PHOTOS

(TDA 1, NDA 1)

The collection point for NDA 1. Runoff exists the project Site as sheet flow and is collected by this Type 1 catch basin on the intersection of NW Juniper St and 6th Ave NW.

Type-2 catch basin at the intersection of NW Locust St and 7th Ave NW that conveys the runoff nothwesterly.